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VISCOSITY ITERATIVE METHOD FOR A SPLIT EQUALITY MONOTONE VARIATIONAL INCLUSION PROBLEM

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Abstract. We propose and analyze a viscosity iterative method for solving a split equality monotone variational inclusion problem, a split equality generalized equilibrium problem and a multiple-set split equality common fixed point problem for two countable families of nonexpansive mappings in real Hilbert spaces. Further, we prove that the sequences generated by the proposed iterative method converge strongly to a common solution to these problems which is also a solution of a system of variational inequality problems. Some consequences are derived from the main result. Finally, we give a numerical example to justify the main result. The results and method presented in this paper generalize, extend and unify some known results in the literature.

Keywords. Split equality monotone variational inclusion problem, split equality generalized equilibrium problem, multiple-set split equality common fixed point problem, viscosity iterative algorithm, strong convergence.

AMS (MOS) subject classification: 47H09, 47J25, 49J40.

1 Introduction

Let H_1, H_2 and H_3 be real Hilbert spaces. Let $C \subset H_1$ and $Q \subset H_2$ be nonempty closed convex sets. We denote the inner product and norm of H_1, H_2 and H_3 by using same notation $\langle \cdot, \cdot \rangle$ and $\| \cdot \|$, respectively. Let $A : H_1 \to H_3$, $B : H_2 \to H_3$ be two bounded linear operators. We consider and study the following three classes of problems:

Multiple-set split equality common fixed point problem for countable families of nonexpansive mappings (in short, MSS$_{\rm p}$ECFPP):